doubt. An independent confirmation of these results is also obtained from a comparison of '*distance*' measured at Königsberg and at Oxford.

Another remark also occurs, which is this: the relative displacements of these distant suns, although not distinctly and accurately measurable in numerical extent, appear to vary both in direction and amount; indicating thereby the mutual influence of a group of gravitating bodies, and not simply that common motion of the whole which would necessarily arise simply from the translation of the solar system in space.

In further connection with the completion, for the present, of this very interesting inquiry into the observable motions of a cosmical system, I may take this opportunity of stating, that I have laid the foundation for a similar enquiry, destined for the astronomers of the future, by making with scrupulous care, in the University Observatory, a series of observations of the relative positions of some 250 stars of a cluster in *Cygnus* (39 Messier), which I hope, in due time, to communicate to the Society. Perhaps these measures, after the lapse of a century or more, may, like Bradley's observations, made 130 years ago, again serve to trace the effects of gravitation, in systems of suns, possibly detached from our own.

Oxford: 1884 *May* 8.

Observations made at the U.S. Naval Observatory, Washington.

By Prof. Asaph Hall.

(*Communicated by Commodore S. R. Franklin, U.S.N., Supt.*)

Conjunction of the Satellites of Saturn.

Mimas.

Date.		Wash. M.T. h m	Position.	Wt.	Remarks.
1883 Dec.	3	10 55·8	S.p.	3	
	3	12 10·8	S.p.	3	
	6	9 19·9	S.	3	
1884 Jan.	26	6 40·8	S.	3	
Feb.	1	9 46·5	N.	3	

Enceladus.

1883 Dec.	6	9 44·4	N.	3	
	17	8 42·3	N.	3	
	28	7 45·9	N.	2	
1884 Jan.	21	7 6·7	S.	3	
Feb.	1	6 18·0	S.	3	
	18	9 25·6	N.	3	
	29	8 35·1	N.	3	

Tethys.

Date.		Wash. M.T.	Position.	Wt.	Remarks.
		h m			
1883 Dec.	15	10 40·2	S.	2	Cloudy
	17	7 59·3	S.	3	
1884 Jan.	2	8 50·5	N.	2	
	3	7 36·5	S.	2	Very faint, hazy
	4	6 8·1	N.	3	
	20	7 15·6	S.	3	
	21	5 54·7	N.	3	
Feb.	21	9 35·8	S.	2	

Dione.

1883 Nov.	4	11 12·7	N.	3	
Dec.	11	9 18·1	S.	1	Strong moonlight
1884 Jan.	6	9 0·8	N.	3	
	17	7 44·7	N.	3	
Feb.	1	9 3·0	S.	3	
	23	6 35·8	S.	2	Cloudy

Rhea.

1883 Dec.	17	10 0·3	N.	3	
1884 Jan.	20	6 38·1	S.	3	

Observations of the Satellites of Mars.

Phobos.

Date.		Wash. M.T.	p.	Wt.	Wash. M.T.	s.	Wt.	Remarks.
		h m	°		h m	″		
1884 Jan.	26	9 59·8	95·1	3	10 12·3	20·35	3	Very faint
Feb.	1	11 12·0	90·1	2	11 20·5	19·70	2	Very faint

Deimos.

1884 Jan.	22	11 32·7	89·8	2	...	...	...	Clouds
	25	13 17·3	263·25	3	13 23·3	46·43	3	
	25	14 39·3	268·45	2	14 45·8	49·23	2	
	26	8 33·3	97·89	3	8 39·3	41·52	3	Faint
	29	9 35·9	268·65	3	9 41·9	48·80	3	
	29	10 54·4	272·03	3	11 0·9	47·25	3	Faint
Feb.	1	11 33·0	82·21	2	11 40·0	45·08	2	Faint
	15	9 8·0	80·44	3	9 18·0	45·35	3	Faint
	15	10 19·5	84·78	3	10 30·5	45·75	3	
	20	10 58·7	82·51	2	11 9·2	44·73	2	Very faint

Comparison with Marth's Ephemeris.

Phobos.

		(C−O) Δp	Δs
Jan.	26	−4°.4	−1″.44
Feb.	1	−3.0	−0.36

Deimos.

Jan.	22	+1.68	...
	25	+1.21	−0.86
	25	+0.58	−1.13
	26	+0.33	+0.89
	29	+0.02	−0.46
	29	+0.70	−0.29
Feb.	1	+0.34	+0.42
	15	+1.63	+0.01
	15	+0.53	+0.56
	20	+0.77	+0.19

Observations of the Companion of Sirius.

Date.	Sid. Time.	p.	s.	Wt.	Remarks.
	h	°	″		
1884·170	5·6	39·0	8·89	2	Very faint
·206	6·1	38·0	8·76	2	Faint
·209	6·2	37·5	8·64	2	Faint
·225	6·8	36·5	8·76	2	Very faint
·231	6·7	37·5	8·87	3	
·247	7·3	37·8	8·95	2	Faint
·250	7·4	37·2	8·87	2	
·269	7·9	37·8	8·74	3	

Mean Results.

	p.	s.
1884·226	37°.67	8″.810

In observing the conjunctions of the satellites of *Saturn* the wire of the micrometer was set perpendicular to the major axis of the ring by means of the angle given in the American *Ephemeris*, p. 465, and the time was noted when the satellite was bisected

by the wire. The satellite was watched several minutes before and after the conjunction. On Dec. 3 *Mimas* was observed in conjunction with the preceding end of the Cassini division of the ring, and again when in conjunction with the preceding edge of the ball. On good nights, with the present opening of the ring, this satellite can be followed to conjunction with ease and certainty.

The two observations of the inner satellite of *Mars* were made with difficulty, and these observations are of little value except to show that the elements of this satellite are nearly correct. The outer satellite could be observed accurately for about one month when near opposition. It could be followed longer with our 26-inch glass, but it is hardly worth while to do this, and thus bring in a quantity of uncertain observations. In both cases the residuals in the angles indicate small corrections to the periods of these satellites, but these periods are no doubt accurate enough to carry forward the Ephemerides for several succeeding oppositions of the planet. As the motion of these satellites in angle of position is now direct, or different from what it was at the time of discovery, it seems better to wait for further observations—at least during one favourable opposition—before making a final discussion of the observations. The observations above are corrected for differential refraction, and for the figure of the planet.

I am much indebted to Mr. Marth for the Ephemerides of satellites that he publishes.

The companion of *Sirius* has been very faint and difficult to observe during the present year. This was owing chiefly, I think, to the very unfavourable weather that has prevailed. The rainfall at Washington has been about 21 inches during the first three months of the year.

The Motion of Hyperion. By Prof. Asaph Hall.

In the *Astronomische Nachrichten*, Nos. 2246 and 2263, I have called attention to the motion of this satellite of *Saturn*, and to the difficulties that prevent an accurate determination of this motion. These difficulties arise in part from the fewness of the observations made from the time of its discovery in 1848 until 1875. In fact, during this interval of twenty-seven years the only complete series of observations is that made by Mr. Lassell at the opposition of 1852. For this reason the mean motion of this satellite is not yet well known, and it appears that we must wait for still further observations; but the following results may be of some interest, and may induce some astronomer who has the means, to assist in observing this faint object.

Denoting by s the observed distance of the satellite from the